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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/473,988	12/29/1999	TOSHIKAZU INOUE	991493	1714

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ARMSTRONG, WESTERMAN & HATTORI, LLP
1725 K STREET, NW.
SUITE 1000
WASHINGTON, DC 20006

EXAMINER

DOAN, THERESA T

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 07/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/473,988

Applicant(s)

INOUE ET AL.

Examiner

Theresa T Doan

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 25 June 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 and 11-20 is/are pending in the application.
- 4a) Of the above claim(s) 11-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☒ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☒ received.
2. ☐ received in Application No. (Series Code / Serial Number) _____.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: _____

DETAILED ACTION

Request for Continued Examination

The request filed on 06/25/02 for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection is acceptable and a RCE has been established. An action on the RCE follows.

Claim Objections

1. Claim 8 is objected to because of the following informalities:

The limitation of "... a third insulating layer..." as recited in claim 8 should be read "... the third insulating layer...". Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

3. Claims 1-9 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Taniguchi et al. (6,232,663).

Regarding claims 1-2, 4-5 and 7-9, Taniguchi et al. teach in figures 1-11 a semiconductor device comprising a semiconductor element 10 formed on a semiconductor substrate¹, and a multi-layered interconnection structure 30 formed over semiconductor element 10 and electrically connected to the semiconductor element (figures 1 and 11),

wherein the multi-layered interconnection structure 30 is an interconnection structure of at least two layers in which a conductive film 10 or a lower interconnection layer and an upper interconnection layer⁵ formed on an insulating interlayer are electrically connected through a contact hole formed in the insulating interlayer (figure 11, column 5, lines 32-67),

the insulating interlayer formed on a conductive film 10 includes:

a first insulating layer 2 of a composition containing SiH (column 6, lines 20-24);

and

a second insulating layer 30 formed on the first insulating layer 2; and

a third insulating layer 11 formed between the conductive film 10 and the first insulating layer 2,

the first insulating layer 2 has an H content of not less than 15.4 atom % in the composition ($\text{HSiO}_{3/2}$), and has been formed to cover the conductive film 10 with the third insulating layer 11 being interposed therebetween (figures 1 and 11), and

the second insulating layer 30 has a multiplayer structure that made up from layers of the same material (column 7, lines 7-62).

—> Regarding claims 2, 7 and 9, the claimed limitations of a threshold at which a degassing amount from the insulating layer abruptly decreases upon a slight increase in the SiH content exists in the relation between the SiH content of the first insulating layer and the degassing amount from the first insulating layer,

the first insulating layer has a SiH content not less than the threshold. It is inherent in Taniguchi's device because the claimed structure is identical to Taniguchi's structure.

Regarding claim 6, Taniguchi et al. teach in figure 11 a semiconductor element comprises a memory cell having a floating gate formed on a tunnel insulating film on the semiconductor substrate 1, a control gate extending on a dielectric film on the floating gate, and a source and a drain formed in surface regions of the semiconductor substrate on both sides of the control gate, and memory information is written and erased by controlling the amount of electrons in the floating gate.

Regarding claims 3 and 20, Taniguchi et al. teach in figure 11 a contact hole for exposing part of a surface of the conductive film 10 is formed, an interconnection layer electrically connected to the conductive film 10 through the contact hole is formed, the contact hole having a moderately tapered upper wall surface at the portion corresponding to the second insulating layer 30 and the second insulating layer 30 having a multi-layer structure made up from layers of the same material.

Response to Arguments

Applicant's arguments with respect to claims 1-9 and 20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Theresa T Doan whose telephone number is (703) 305-2366. The examiner can normally be reached on 8:00AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, OLIK CHAUDHURI can be reached on (703) 308-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TD
July 23, 2002



OLIK CHAUDHURI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800